

Gunter, Jason

From: Seabourne, Rocky <rseabourne@doerun.com>
Sent: Thursday, November 19, 2015 9:21 AM
To: 'brandon.wiles@dnr.mo.gov'; Gunter, Jason; Montgomery, Michael; Neaville, Chris; Ty Morris; Yingling, Mark
Subject: Emailing: Elvins-Rivermines Monthly Progress Report October
Attachments: Elvins-Rivermines Monthly Progress Report October.pdf; 9 - Remediation Air Report - September 2015.pdf; 2015-10-07 RM NPDES Pace Lab Report.pdf

Your message is ready to be sent with the following file or link attachments:

Elvins-Rivermines Monthly Progress Report October

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Rocky Seabourne
General Supervisor Land & Remediation
rseabourne@doerun.com

November 12, 2015

Mr. Jason Gunter Remedial Project Manager U.S. Environmental Protection Agency
Region 7 – Superfund Branch 11201 Renner Blvd.
Lenexa, KS 66219

RE: The Doe Run Company – Elvins/Rivermines Mine Tailings Site Monthly Progress Report

Dear Mr. Gunter:

As required by Article VI, Section 56 of the Unilateral Administrative Order (UAO) (CERCLA-07-2005-0169) for the referenced project and on behalf of The Doe Run Company, the progress report for the period of October 1, 2015 through October 31, 2015 is enclosed. If you have any questions or comments, please feel free to contact me at 573-244-8136.

Sincerely,

A handwritten signature in black ink that reads 'Rocky Seabourne'.

Rocky Seabourne

General Supervisor Land & Remediation
c:Mark Yingling – TDRC (electronic only)
Chris Neaville – TDRC (electronic only)
Michael Montgomery - TDRC (electronic only)
Brandon Wiles – MDNR HWP
Ty Morris – Barr Engineering

Elvins/Rivermines Mine Tailings Site
Park Hills, Missouri
Removal Action - Monthly Progress Report
Period: October 1, 2015 – October 31, 2015

1. Actions performed or Completed This Period:
 - a. Work continued on the development of the Post-Removal Site Control Plan for the site.
 - b. Given the nature of the work remaining at the site, The Doe Run Company would like to request a reduction in the frequency of the progress reports to quarterly.
 - c. Monthly water samples were taken during the removal action activities. These samples have been continued since the completion of the removal action activities. The analytical results, which have been included in the progress reports, have shown little variation. As a result Doe Run would like to request a reduction in the frequency of the sampling to quarterly.
 - d. Started construction on Storm Water Management Plan.
 - e.
2. Analytical Data and Results Received This Period:
 - a. During this period, water samples were collected from just upstream of Old Missouri Highway 32, as well as from upstream and downstream of the confluence of the site discharge with Flat River. The analytical results for this event are included with this progress report.
 - b. During this period, the ambient air monitoring samples for September were processed and attached.
3. Developments Anticipated and Work Schedule for Next Period:
 - a. Complete the water sampling activities.
 - b. Complete air monitoring activities as described in the Removal Action Work Plan.
 - c. Continue developing the Post-Removal Site Control Plan.
4. Issues or Problems Encountered and the Resolution:
 - a. None.

Monthly Ambient Air Monitoring Report

The Doe Run Company
Old Lead Belt Sites:
Federal, Rivermines, National, and Leadwood

September-2015



SUITE 300
1801 PARK 270 DRIVE
ST. LOUIS, MO 63146

Federal Site

Sample Results for **September-2015**

	St. Joe (Ballfields)		Big River#4		Water Treatment Plant	
Sample Date	TSP ug/m3	Lead ug/m3	TSP ug/m3	Lead ug/m3	TSP ug/m3	Lead ug/m3
9/1/15	44	0.007	invalid	invalid	33	0.007
9/2/15	48	0.007	35	0.020	20	0.007
9/3/15	36	0.007	46	0.028	24	0.007
9/4/15	44	0.007	31	0.014	27	0.014
9/8/15	30	0.028	22	0.021	22	0.028
9/9/15	18	0.007	invalid	invalid	invalid	invalid
9/10/15	16	0.007	14	0.020	invalid	invalid
9/11/15	20	0.007	14	0.007	14	0.007
9/14/15	24	0.007	invalid	invalid	17	0.007
9/15/15	27	0.007	24	0.021	23	0.014
9/16/15	34	0.007	30	0.014	24	0.007
9/17/15	35	0.014	36	0.007	33	0.007
9/18/15	28	0.007	16	0.007	22	0.007
9/21/15	20	0.007	47	0.007	16	0.014
9/22/15	22	0.014	30	0.033	21	0.014
9/23/15	29	0.042	35	0.021	33	0.041
9/24/15	27	0.021	28	0.013	12	0.007
9/25/15	31	0.014	invalid	invalid	invalid	invalid
9/28/15	13	0.007	17	0.000	13	0.000
9/29/15	21	0.007	19	0.007	22	0.007
9/30/15	22	0.007	19	0.007	21	0.014

Monthly Avg. TSP	28	27	22
Monthly Avg. Pb	0.011	0.014	0.012
Aug-15	0.012	0.012	0.021
Jul-15	0.007	0.008	0.014
Rolling 3-Month	0.010	0.011	0.016

Three month rolling average must be less than 0.15 ug/m3

	Big River QA	
Sample Date	TSP ug/m3	Lead ug/m3
9/1/15	31	0.007
9/3/15	30	0.028
9/8/15	21	0.014
9/10/15	11	0.021
9/15/15	23	0.020
9/17/15	35	0.007
9/22/15	invalid	invalid
9/24/15	invalid	invalid
9/29/15	17	0.007

Notes

A high rate of invalid samples were due to timer issues. An investigation into the problem was conducted on 9/27/15. We expect to see significant improvements going forward.

Rivermines

Sample Results for **September-2015**

Sample Date	Big River #4		Rivermines South #1		Rivermines North #2		Rivermines East #3	
	TSP ug/m3	Lead ug/m3	TSP ug/m3	Lead ug/m3	TSP ug/m3	Lead ug/m3	TSP ug/m3	Lead ug/m3
9/1/15	invalid	invalid	34	0.014	32	0.036	33	0.007
9/2/15	35	0.020	invalid	invalid	38	0.128	20	0.007
9/3/15	46	0.028	26	0.014	27	0.043	24	0.007
9/4/15	31	0.014	invalid	invalid	27	0.021	27	0.014
9/8/15	22	0.021	invalid	invalid	19	0.043	22	0.028
9/9/15	invalid	invalid	invalid	invalid	17	0.043	invalid	invalid
9/10/15	14	0.020	11	0.027	17	0.049	invalid	invalid
9/11/15	14	0.007	invalid	invalid	13	0.007	14	0.007
9/14/15	invalid	invalid	18	0.007	19	0.014	17	0.007
9/15/15	24	0.021	22	0.007	21	0.014	23	0.014
9/16/15	30	0.014	23	0.007	25	0.014	24	0.007
9/17/15	36	0.007	33	0.007	31	0.034	33	0.007
9/18/15	16	0.007	invalid	invalid	20	0.007	22	0.007
9/21/15	47	0.007	48	0.152	18	0.034	16	0.014
9/22/15	30	0.033	28	0.034	22	0.013	21	0.014
9/23/15	35	0.021	50	0.132	30	0.055	33	0.041
9/24/15	28	0.013	51	0.081	24	0.007	12	0.007
9/25/15	invalid	invalid	invalid	invalid	29	0.007	invalid	invalid
9/28/15	17	0.000	29	0.034	8	0.007	13	0.000
9/29/15	19	0.007	58	0.288	20	0.007	22	0.007
9/30/15	19	0.007	76	0.277	19	0.007	21	0.014

Monthly Avg. TSP	27	36	23	22
Monthly Avg. Pb	0.014	0.077	0.028	0.012
Aug-15	0.012	0.068	0.012	0.021
Jul-15	0.008	0.053	0.013	0.014
Rolling 3-Month	0.011	0.066	0.018	0.016

Three month rolling average must be less than 0.15 ug/m3

Sample Date	Big River QA	
	TSP ug/m3	Lead ug/m3
9/1/15	31	0.007
9/3/15	30	0.028
9/8/15	21	0.014
9/10/15	11	0.021
9/15/15	23	0.020
9/17/15	35	0.007
9/22/15	invalid	invalid
9/24/15	invalid	invalid
9/29/15	17	0.007

Notes

A high rate of invalid samples were due to timer issues. An investigation into the problem was conducted on 9/27/15. We expect to see significant improvements going forward.

Federal Site

Sample Results for **September-2015**

	St. Joe (Ballfields)	Big River#4	Water Treatment
Sample Date	PM10 (ug/m3)	PM10 (ug/m3)	PM10 (ug/m3)
9/1/15	invalid	invalid	invalid
9/3/15	30	27	22
9/6/15	invalid	58	invalid
9/9/15	invalid	invalid	invalid
9/12/15	invalid	invalid	invalid
9/15/15	21	invalid	invalid
9/18/15	invalid	invalid	invalid
9/21/15	3	14	invalid
9/24/15	invalid	invalid	invalid
9/27/15	invalid	invalid	invalid
9/30/15	13	12	invalid

Compliance with NAAQS is less than 150 ug/m3

Monthly Avg. PM10	17	28	22
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	Big River QA
Sample Date	PM10 (ug/m3)
9/3/15	invalid
9/9/15	24
9/15/15	invalid
9/21/15	9
9/27/15	13

Notes:

A high rate of invalid samples were due to timer issues. An investigation into the problem was conducted on 9/27/15. We expect to see significant improvements going forward.

Rivermines

Sample Results for **September-2015**

	Big River #4	Rivermines South #1	Rivermines North #2	Rivermines East #3
Sample Date	PM10 (ug/m3)	PM10 (ug/m3)	PM10 (ug/m3)	PM10 (ug/m3)
9/1/15	invalid	invalid	invalid	invalid
9/3/15	27	35	25	22
9/6/15	58	25	23	invalid
9/9/15	invalid	invalid	invalid	invalid
9/12/15	invalid	invalid	invalid	invalid
9/15/15	invalid	invalid	invalid	invalid
9/18/15	invalid	invalid	invalid	invalid
9/21/15	14	15	invalid	invalid
9/24/15	invalid	invalid	invalid	invalid
9/27/15	invalid	invalid	invalid	invalid
9/30/15	12	invalid	invalid	invalid

Compliance with NAAQS is less than 150 ug/m3

Monthly Avg. PM10	28	25	24	22
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	Big River QA
Sample Date	PM10 (ug/m3)
9/3/15	invalid
9/9/15	24
9/15/15	invalid
9/21/15	9
9/27/15	13

Notes:

A high rate of invalid samples were due to timer issues. An investigation into the problem was conducted on 9/27/15. We expect to see significant improvements going forward.

Meterological Data - Old Lead Belt

September-2015

24hr average

Date	Wind Speed (MPH)	Wind Direction	Sigma-Theta	Temperature (C)	Air Pressure (mmHg)	Rain (Inches)	Power Supply (Volts)
01-Sep-15	2.38	201.8	24.24	25.8	747	0	13.18
02-Sep-15	1.581	211	25.21	25.33	746	0	13.17
03-Sep-15	1.642	214.3	26.13	26.04	745	0	13.17
04-Sep-15	1.54	203.1	28.05	26.09	745	0	13.16
05-Sep-15	1.925	186	24.59	25.97	746	0	13.16
06-Sep-15	2.223	189.4	28.84	26.7	745	0	13.15
07-Sep-15	2.412	187	24.92	25.33	745	0	13.18
08-Sep-15	2.855	217	28.2	25.71	743	0.03	13.18
09-Sep-15	1.494	88.8	32.75	22.62	744	0.25	13.21
10-Sep-15	1.768	214.6	35.86	21.7	743	0	13.21
11-Sep-15	3.82	330.8	25.18	18.59	744	0.14	13.27
12-Sep-15	4.372	317.2	24.18	13.57	746	0	13.33
13-Sep-15	2.366	216	35.82	15.14	746	0	13.34
14-Sep-15	3.852	185.3	23.76	18.91	748	0	13.29
15-Sep-15	4.382	179.3	22.71	20.5	749	0	13.25
16-Sep-15	3.933	172.3	23.03	21.8	749	0	13.24
17-Sep-15	5.497	201.5	24.59	25.55	745	0	13.2
18-Sep-15	4.348	218.4	27.75	27.33	741	0	13.17
19-Sep-15	4.484	310.8	25.27	19.73	745	0.01	13.21
20-Sep-15	1.675	161.2	27.69	14.13	748	0	13.33
21-Sep-15	1.861	174.7	33.66	16.26	747	0	13.31
22-Sep-15	1.708	161.6	34.34	18.67	748	0	13.28
23-Sep-15	1.87	161.3	28.98	19.28	749	0	13.26
24-Sep-15	1.884	192.5	32.91	19.06	748	0	13.27
25-Sep-15	2.224	251.6	25.61	18.85	748	0	13.27
26-Sep-15	1.957	95	24.01	16.54	748	0	13.32
27-Sep-15	1.188	125.6	25.8	19.4	745	0.3	13.3
28-Sep-15	1.644	189	27.72	20.59	744	0.1	13.27
29-Sep-15	1.864	356.6	24.95	20.22	744	0.3	13.28
30-Sep-15	4.791	2.608	24.33	15.92	747	0	13.32

INQUEST
ENVIRONMENTAL INC.

3609 Mojave Ct., Ste E ♦ COLUMBIA, MO 65202
(573) 474-8110 ♦ FAX: (573) 474-8371

August 28, 2015

Mr. Greg Henson
Chemist
The Doe Run Company
881 Main Street
Herculaneum, Missouri 63048

RE: Park Hill Monitoring Network 3rd Quarter 2015 Lead/PM10 Samplers and
Meteorological System Performance Audit Report.

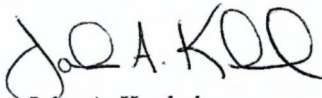
Dear Mr. Henson,

Please find enclosed the worksheets detailing the Lead/PM10 sampler's one-point flow verifications and meteorological sensors accuracy checks that were recently performed on the Doe Run Park Hills Monitoring Network. A copy of the current certifications for the audit devices that were used has also been enclosed.

All of the verifications and checks were found to be within expected guidelines.

After reviewing the enclosed information, please feel free to call with any comments or questions. Thank you for your business.

Sincerely,



John A. Kunkel
Inquest Environmental, Inc.

PM10 Sampler Verifications

INQUEST
Environmental, Inc.**PM10 Sampler Audit**
Volumetric Flow Control3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Big River	Intercept (Qa)	-0.00876
Sampler	#4 Primary PM10	Temperature	28.3 °C 301.5 °K
Flow Controller	P2952	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate	Acceptable
Manometer	Flow Rate	Manometer	Pressure	Press. Ratio	Flow Rate	Percent	Range
"H ₂ O	m ³ /min	"H ₂ O	(Pf)	(Po/Pa)	m ³ /min	Difference	
3.30	1.105	25.40	47.44	0.938	1.139	3.08	± 7%

Sampler Operating Flow Rate						
Manometer	Pressure	Press. Ratio	Flow Rate	Corrected	Design %	Acceptable
"H ₂ O	(Pf)	(Po/Pa)	m ³ /min	Flow Rate	Difference	Range
25.60	47.81	0.937	1.138	1.103	-2.39	± 10%

Calculations:Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

INQUEST

Environmental, Inc.

PM10 Sampler Audit

Volumetric Flow Control

3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Big River	Intercept (Qa)	-0.00876
Sampler	#4 QA PM10	Temperature	28.3 °C 301.5 °K
Flow Controller	P1019	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate Percent Difference	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.40	1.121	27.10	50.61	0.934	1.147	2.32	± 7%

Sampler Operating Flow Rate						
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Design % Difference	Acceptable Range
27.10	50.61	0.934	1.147	1.120	-0.88	± 10%

Calculations:

Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

INQUEST Environmental, Inc.

PM10 Sampler Audit Volumetric Flow Control

3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	January 20, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	St Joe Park	Intercept (Qa)	-0.00876
Sampler	#4 PM10	Temperature	31.8 °C 305.0 °K
Flow Controller	P4353	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate Percent Difference	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.10	1.077	24.90	46.50	0.939	1.136	5.48	± 7%

Sampler Operating Flow Rate						
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Design % Difference	Acceptable Range
24.90	46.50	0.939	1.136	1.074	-4.96	± 10%

Calculations:

Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

INQUEST
Environmental, Inc.**PM10 Sampler Audit**
Volumetric Flow Control3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (Wtr Plnt)	Intercept (Qa)	-0.00876
Sampler	#3 PM10	Temperature	31.8 °C 305.0 °K
Flow Controller	P2951	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate Percent Difference	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.10	1.077	25.50	47.63	0.938	1.147	6.50	± 7%

Sampler Operating Flow Rate						
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Design % Difference	Acceptable Range
25.60	47.81	0.937	1.146	1.072	-5.13	± 10%

Calculations:Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

INQUEST
Environmental, Inc.**PM10 Sampler Audit**
Volumetric Flow Control3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (Quarry)	Intercept (Qa)	-0.00876
Sampler	#1 PM10	Temperature	31.8 °C 305.0 °K
Flow Controller	P4601	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate Percent Difference	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.30	1.111	24.60	45.94	0.940	1.121	0.90	± 7%

Sampler Operating Flow Rate						
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Design % Difference	Acceptable Range
24.50	45.76	0.940	1.121	1.111	-1.68	± 10%

Calculations:Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

INQUEST
Environmental, Inc.**PM10 Sampler Audit**
Volumetric Flow Control3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (Above Quarry)	Intercept (Qa)	-0.00876
Sampler	#2 PM10	Temperature	31.8 °C 305.0 °K
Flow Controller	P4507	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Flow Rate Percent Difference	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.30	1.111	26.00	48.56	0.936	1.136	2.25	± 7%

Sampler Operating Flow Rate						
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Design % Difference	Acceptable Range
26.10	48.75	0.936	1.136	1.110	-1.77	± 10%

Calculations:Pressure mmHg (Pf) - ("H₂O/13.6) * 25.4

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Flow Rate Percent Difference- (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Percent Difference)/100)

Design Percent Difference- (Corrected Flow Rate-1.13)/1.13*100

Lead/TSP Sampler Verifications

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Big River Primary	Intercept (Qa)	-0.00876
Sampler	#4 TSP	Temperature	28.3 °C 301.5 °K
Flow Controller	P4557	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.85	1.193	23.90	44.65	0.942	1.239	3.86	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
23.00	42.97	0.944	1.242	1.194	1.10 - 1.70

Calculations:

Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Big River QA	Intercept (Qa)	-0.00876
Sampler	#4 TSP	Temperature	28.3 °C 301.5 °K
Flow Controller	P4558	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.90	1.200	23.10	43.16	0.944	1.237	3.08	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
23.10	43.16	0.944	1.237	1.199	1.10 - 1.70

Calculations:

Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

INQUEST

Environmental, Inc.

Lead Sampler Audit

Volumetric Flow Control

3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	St Joe Park	Intercept (Qa)	-0.00876
Sampler	#4 TSP	Temperature	31.8 °C 305.0 °K
Flow Controller	P6792	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.70	1.176	22.60	42.22	0.945	1.242	5.61	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
22.90	42.78	0.944	1.241	1.171	1.10 - 1.70

Calculations:

Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (Water Plant)	Intercept (Qa)	-0.00876
Sampler	TSP	Temperature	31.8 °C 305.0 °K
Flow Controller	P4475	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.70	1.176	24.40	45.59	0.940	1.232	4.76	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
24.50	45.77	0.940	1.232	1.173	1.10 - 1.70

Calculations:

Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

INQUEST
Environmental, Inc.**Lead Sampler Audit**
Volumetric Flow Control3609 Mojave Court, Suite E
Columbia, Missouri 65202
573-474-8110

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (Quarry)	Intercept (Qa)	-0.00876
Sampler	#1 TSP	Temperature	31.8 °C 305.0 °K
Flow Controller	P2940	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.60	1.160	23.70	44.28	0.942	1.240	6.90	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
23.20	43.35	0.943	1.241	1.155	1.10 - 1.70

Calculations:Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

Date	July 29, 2015	Auditor	John Kunkel
Operator	The Doe Run Company	Transfer Orifice	1882
Location	Park Hills Network	Slope (Qa)	1.04094
Station	Rivermines (above quarry)	Intercept (Qa)	-0.00876
Sampler	#1 TSP	Temperature	31.8 °C 305.0 °K
Flow Controller	P2941	Station Pressure	30.08 "Hg 764.0 mmHg

Flow Rate Audit							
Transfer Orifice		Sampler				Calibration Error %	Acceptable Range
Manometer "H ₂ O	Flow Rate m ³ /min	Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min		
3.70	1.176	23.20	43.35	0.943	1.243	5.70	± 7%

Sampler Operating Flow Rate					
Manometer "H ₂ O	Pressure (Pf)	Press. Ratio (Po/Pa)	Flow Rate m ³ /min	Corrected Flow Rate	Acceptable Range
22.90	42.78	0.944	1.244	1.173	1.10 - 1.70

Calculations:

Pressure mmHg (Pf) - "H₂O * 1.86832

Pressure Ratio (Po/Pa) - 1-Pf/Pa

Orifice Flow Rate (Qa) - 1/Slope*(Sqrt("H₂O*(Ta/Pa))-Intercept)

Sampler Flow Rate (Qa) - Taken from the look-up tables

Calibration Error - (Sampler Flow-Orifice Flow)/Orifice Flow*100

Corrected Flow Rate - Operating Flow*((100-Calibration Error)/100)

Calibration Orifice Certification Worksheet



TISCH ENVIRONMENTAL, INC.
 145 SOUTH MIAMI AVE
 VILLAGE OF CLEVELAND, OH
 45002
 513.467.9000
 877.263.7610 TOLL FREE
 513.467.9009 FAX

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5028A

Date - Jan 13, 2015 Rootmeter S/N 9833620 Ta (K) - 292
 Operator Tisch Orifice I.D. - 1882 Pa (mm) - 765.81

PLATE OR VDC #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.3360	4.3	1.50
2	NA	NA	1.00	1.0560	6.8	2.50
3	NA	NA	1.00	0.9570	8.2	3.00
4	NA	NA	1.00	0.8870	9.5	3.50
5	NA	NA	1.00	0.6670	16.5	6.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)	Va	(x axis) Qa	(y axis)
1.0225	0.7654	1.2420	0.9943	0.7443	0.7553
1.0191	0.9651	1.6034	0.9910	0.9385	0.9763
1.0173	1.0630	1.7564	0.9892	1.0337	1.0695
1.0155	1.1449	1.8972	0.9875	1.1133	1.1552
1.0061	1.5084	2.4840	0.9784	1.4668	1.5125
Qstd slope (m) = 1.66236			Qa slope (m) = 1.04094		
intercept (b) = -0.01438			intercept (b) = -0.00876		
coefficient (r) = 0.99927			coefficient (r) = 0.99927		
y axis = SQRT[H2O(Pa/760) (298/Ta)]			y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol [(Pa-Diff. Hg)/760] (298/Ta)
 Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
 Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{ [SQRT(H2O(Pa/760) (298/Ta))] - b}
 Qa = 1/m{ [SQRT H2O(Ta/Pa)] - b}

Meteorological Sensor's Accuracy Checks

Inquest Environmental, Inc.

Wind Direction Sensor Performance Audit

Operator The Doe Run Co.
 Location Big River
 Station Name Meteorological System
 Technician J Kunkel / M Kunkel

Date 07/29/2015
 Start Time 10:30
 Stop Time 11:30

Sensor Mfg RM Young
 Sensor Model Wind Monitor AQ
 Serial Number 128618
 Sensor Height 10.0 Meters

Station Declination 1.1 Deg
 Measured Angle 180.0 Deg
 Corrected Angle 181.1 Deg
 Alignment Error -1.1 Deg

Vane Angle	Data Logger	Results	
		Difference	Total Error
Degrees	Degrees	± 3 Deg Limit	± 5 Deg Limit
0/360	1.1	1.1	0.0
90	91.9	1.9	0.8
180	181.1	1.1	0.0
270	271.9	1.9	0.8

Average Difference (Degrees)	1.5
Average Total Error (Degrees)	0.4

Audit Device	Wind Vane Alignment	Direction
Type	Pocket Transit	Vane Angle Fixture
Mfg.	Brunton	R.M. Young
Model	5008	18212
Serial No.	5080304492	None

Comments: Wind direction was verified by determining the orientation of the sensor in respect to True North. This was measured using a tri-pod mounted transit aligned along the length of the sensor while locked from rotating. A magnetic declination of 1.1 degrees was used to determine True North. The linearity of the sensor was determined by aligning the sensor to an indexed test fixture provided by the manufacturer. The four cardinal directions were verified using the fixture. No adjustments were made to the sensor.

Inquest Environmental, Inc.

Wind Speed Sensor Performance Audit

Operator The Doe Run Co.
 Location Big River
 Station Name Meteorological System
 Auditor(s) J Kunkel / M Kunkel

Date 07/29/2015
 Start Time 10:30
 Stop Time 11:30

Sensor Mfg RM Young
 Sensor Model Wind Monitor AQ
 Serial Number 128618
 Sensor Height 10.0 Meters

Audit Standard		DAS Response		Limit
RPM	M/S	M/S	Difference	M/S
Zero	0.00	0.00	0.00	0.25
300	1.54	1.56	0.02	0.25
600	3.07	3.07	0.00	0.25
1200	6.14	6.15	0.01	0.56
1800	9.22	9.21	-0.01	0.71
3600	18.43	18.44	0.01	1.17
5400	27.65	27.63	-0.02	1.63
7200	36.86	36.85	-0.01	2.09
Average			0.00	

± (0.25 m/s + 5%)

Audit Device	Anemometer Drive
Type	Variable Speed
Mfg.	R.M. Young
Model	18801
Serial No.	CAO1631

Comments: Wind speed was verified using a variable speed anemometer drive. The propellor was removed from the sensor and the drive was connected using a flexible connector. The sensor was then rotated in the appropriate direction at several different speeds. Sensor responses were taken from the data logger. No adjustments were made to the sensor.

Inquest Environmental, Inc.

Temperature Sensor Performance Audit

Operator The Doe Run Co.
 Location Big River
 Station Name Meteorological System
 Technician J Kunkel / M Kunkel

Date 07/29/2015
 Start Time 10:30
 Stop Time 11:30

Sensor Information

Sensor Mfg Climatronics
 Sensor Model NA
 Serial Number NA
 Sensor Height 2 meters

Audit Device °C	Sensor	
	Data Logger °C	Difference °C
0.5	0.5	0.0
34.1	33.9	-0.2
44.0	43.9	-0.1
Average		-0.1

Note: The limit for each point is +/- 0.5 °C

Audit Device	
Type	Digital Thermometer
Mfg.	Control Company
Model	15-077-8
Serial No.	221381405

Comments: The temperature is verified by co-locating the sensor with a certified digital thermometer. The verification is conducted at three levels using two water baths (iced and hot water) and the ambient temperature. The sensor error was determined by comparing the sensor's data logger response to the display on the certified digital thermometer. No adjustments were made to the sensor.

Inquest Environmental, Inc.

Barometric Pressure Sensor Performance Audit

Operator The Doe Run Co.
 Location Big River
 Station Name Meteorological System
 Technician J Kunkel / M Kunkel

Date 07/29/2015
 Start Time 10:30
 Stop Time 11:30

Sensor Mfg Setra
 Sensor Model 276
 Serial Number 2626447

Audit Device	Data Logger Response	
	BP	Difference
mm HG	mm HG	mm HG
741.20	744.60	3.40

Note: Limit is +/- 7.5 mm HG.

Audit Device	
Type	Digital Barometer
Mfg.	AIR
Model	AIR-HB-1A
Serial No.	6G3745

Comments: The barometric pressure is verified by co-locating the sensor with a certified digital barometer. The verification was conducted at one level after allowing the sensor and calibration device ample time to stabilize.
The sensor error was determined by comparing the sensor's data logger response to the display on the certified digital barometer. No adjustments were made to the sensor.

Inquest Environmental, Inc.

Precipitation Gauge Performance Audit

Operator The Doe Run Co
Location Big River
Station Name Meteorological System
Technician J Kunkel / M Kunkel

Date 07/29/2015
Start Time 10:30
Stop Time 11:30

Sensor Mfg Texas Electronics
Sensor Model TR525I
Serial Number 36611-805
Diameter (inches) 6.00

Audit Device	Data Logger Response	
	Gauge	Difference
Known Tips	Tips	%
96.00	90.00	-6.25

Note: Limit is +/- 10%.

Audit Device	
Type	Graduated Beaker
Mfg.	Texas Instruments
Model	FC-525
Serial No.	NA

Comments: The precipitation gauge output was verified using a field calibration kit
supplied by the manufacturer. The kit consists of a graduated beaker
and a calibration funnel using a precision orifice at the water outlet.
Water was measured in the beaker and poured into the funnel while
mounted on the gauge. The amount of precipitation recorded by the
data logger was then compared to the known amount of water passing
through the funnel. 100 tips equals one inch of rainfall. The gauge
was cleaned and no adjustments were made.

Meteorological Audit Devices Certifications

BRUNTON OUTDOOR GROUP

CERTIFICATE OF CALIBRATION

Equipment Owner

Name: Inquest Environmental Mitch Kunkel
Address: 3609 Majors Court, Ste E
Columbia, MO 65207

Calibration traceable to the National Institute of Standards and Technology in accordance with MIL-STD-45662A has been accomplished on the instrument listed below by comparison with standards maintained by the Brunton Outdoor Group. The accuracy and stability of all standards maintained by the Brunton Outdoor Group are traceable to national standards maintained by the National Institute of Standards and Technology in Washington, D.C. and Boulder, CO. Completed record of all work performed is maintained by the Brunton Outdoor Group and is available for inspection upon request.

This unit has been calibrated to Lietz TM10E serial number 30937 traceable to N.B.S. Number 738227675 this July Day 30 20 14.

Description Pocket Transit

Purchase Order 256430329

Order Number 50-070367

Model Number F-5008

Serial Number 5080364492

Calibration Date 7/30/14

Recalibration Date 7/30/15

Signed Edin Ruppel 7/30/14

Quality Control Coordinator



CALIBRATION PROCEDURE
18801/18810 ANEMOMETER DRIVE

DWG: CP18801(A)

REV: C101107

PAGE: 2 of 4

BY: TJT

DATE: 10/11/07

CHK: JC

W.C. GAS-12

CERTIFICATE OF CALIBRATION AND TESTING

MODEL: 18801 (Comprised of Models 18820 Control Unit & 18830 Motor Assembly)
SERIAL NUMBER: CA01631

R. M. Young Company certifies that the above equipment was inspected and calibrated prior to shipment in accordance with established manufacturing and testing procedures. Standards established by R.M. Young Company for calibrating the measuring and test equipment used in controlling product quality are traceable to the National Institute of Standards and Technology.

Nominal Motor Rpm	Output Frequency Hz (1)	Calculated Rpm (2)	Indicated Rpm (3)
600	320	600	600
1200	640	1200	1200
2400	1280	2400	2400
4200	2240	4200	4200
6,000	3200	6000	6000
8,100	4320	8100	8100
9,900	5280	9900	9900
<input checked="" type="checkbox"/> Clockwise and Counterclockwise rotation verified			

- (1) Measured at the optical encoder output.
(2) Frequency output produces 32 pulses per revolution of motor shaft.
(3) Indicated on the Control Unit LCD display.

* Indicates out of tolerance

☒ No Calibration Adjustments Required

☐ As Found

☐ As Left

Traceable frequency meter used in calibration Model: DP574D SN: 4863

Date of inspection 10 Dec 2014
Inspection Interval One Year

Tested By EC



Calibration
Certificate No. 1750.01

Calibration complies with ISO/IEC
17025, ANSI/NCSL Z540-1, and 9001



Cert. No.: 4000-6726396

Traceable® Certificate of Calibration for Digital Thermometer

Cust ID: Inquest Environmental Inc., 3609 Mojave Court, Suite E, Columbia, MO 65202 U.S.A. (RMA:995292)

Instrument Identification:

Model Numbers: 15-077-8, 11705843 S/N: 221381404 Manufacturer: Control Company
Model: 15-077-7 S/N: 51202300

Standards/Equipment:

Description	Serial Number	Due Date	NIST Traceable Reference
Temperature Calibration Bath TC-179	A45240		
Thermistor Module	A17118	3/03/16	1000371058
Temperature Probe	3039	4/02/16	15-A0P2S-20-1
Temperature Calibration Bath TC-231	A79341		
Thermistor Module	A27129	11/04/15	1000365407
Temperature Probe	5202	11/19/16	6-CV9Y2-1-1
Temperature Calibration Bath TC-309	B3A444		
Thermistor Module	A27129	11/04/15	1000365407
Temperature Probe	5267	11/19/16	6-CV9Y0-1-1

Certificate Information:

Technician: 68 Procedure: CAL-06 Cal Date: 4/28/15 Due Date: 4/28/16
Test Conditions: 22.4°C 47.0 %RH 1012 mBar

Calibration Data:

Unit(s)	Nominal	As Found	In Tol	Nominal	As Left	In Tol	Min	Max	±U	TUR
°C	-0.001	0.011	Y	-0.001	-0.001	Y	-0.051	0.049	0.013	3.8:1
°C	24.999	24.999	Y	24.999	25.000	Y	24.949	25.049	0.014	3.6:1
°C	60.003	60.007	Y	60.003	60.001	Y	59.953	60.053	0.014	3.6:1
°C	100.000	100.012	Y	100.000	100.004	Y	99.950	100.050	0.014	3.6:1

This Instrument was calibrated using Instruments Traceable to National Institute of Standards and Technology.

A Test Uncertainty Ratio of at least 4:1 is maintained unless otherwise stated and is calculated using the expanded measurement uncertainty. Uncertainty evaluation includes the instrument under test and is calculated in accordance with the ISO "Guide to the Expression of Uncertainty in Measurement" (GUM). The uncertainty represents an expanded uncertainty using a coverage factor k=2 to approximate a 95% confidence level. In tolerance conditions are based on test results falling within specified limits with no reduction by the uncertainty of the measurement. The results contained herein relate only to the item calibrated. This certificate shall not be reproduced except in full, without written approval of Control Company.

Nominal=Standard's Reading; As Left=Instrument's Reading; In Tol=In Tolerance; Min/Max=Acceptance Range; ±U=Expanded Measurement Uncertainty; TUR=Test Uncertainty Ratio; Accuracy=±(Max-Min)/2; Min = As Left Nominal(Rounded) - Tolerance; Max = As Left Nominal(Rounded) + Tolerance; Date=MM/DD/YY

Nicol Rodriguez
Nicol Rodriguez, Quality Manager

Aaron Judice
Aaron Judice, Technical Manager

Maintaining Accuracy:

In our opinion once calibrated your Digital Thermometer should maintain its accuracy. There is no exact way to determine how long calibration will be maintained. Digital Thermometers change little, if any at all, but can be affected by aging, temperature, shock, and contamination.

Recalibration:

For factory calibration and re-certification traceable to National Institute of Standards and Technology contact Control Company.

CONTROL COMPANY 4455 Rex Road Friendswood, TX 77546 USA
Phone 281 482-1714 Fax 281 482-9448 service@control3.com www.control3.com

Control Company is an ISO 17025:2005 Calibration Laboratory Accredited by (A2LA) American Association for Laboratory Accreditation, Certificate No. 1750.01.
Control Company is ISO 9001:2008 Quality Certified by (DNV) Det Norske Veritas, Certificate No. CERT-01805-2008-AQ-HOU-RvA.
International Laboratory Accreditation Cooperation (ILAC) - Multilateral Recognition Arrangement (MRA).



HASS INSTRUMENT CORPORATION

6711 OLD BRANCH AVENUE • CAMP SPRINGS, MD 20748-6990 • (301) 449-5454 • FAX (301) 449-5455

CALIBRATION REPORT

BAROMETER/ALTIMETER
AIR Model AIR-HB-1A
Serial No. 6G3745

<u>TEST POINT</u>	<u>TEST PRESSURE</u>	<u>DIGITAL READOUT</u>	<u>READOUT ERROR</u>	<u>CORRECTION REQUIRED</u>
1	930.00	931.9	+1.9	-1.9
2	970.00	971.9	+1.9	-1.9
3	1010.00	1011.9	+1.9	-1.9
4	1050.00	1051.9	+1.9	-1.9
5	1011.97	1013.9	+1.9	-1.9

NOTES:

1. All data are in Millibars (hPA) and were taken at 70 F (21 C).
2. To correct the Digital Readout of the instrument, either algebraically add the CORRECTION REQUIRED to, or algebraically subtract the READOUT ERROR from, the readout shown on the instrument.
3. The TEST PRESSURE was generated using Type A-1 Barometer S/N 3327, and was approached in an increasing-pressure direction.
4. The TEST PRESSURE for TEST POINT 5 was ambient atmospheric pressure.
5. The BAROMETER/ALTIMETER was horizontal during the calibration.
6. The LCD screen of the BAROMETER/ALTIMETER has some trash in the center of the display, but it does not interfere with the readout.
7. Although the Digital Readout of the instrument can be adjusted to incorporate the average CORRECTION REQUIRED, this has not been done.

Calibration Date: 10 March 2015

By: Bernard I. Hass

(SEAL)

Bernard I. Hass



Pace Analytical Services, Inc.
9608 Loiret Blvd.
Lenexa, KS 66219
(913)599-5665

October 15, 2015

Amy Sanders
The Doe Run Company
P. O. Box 500
Viburnum, MO 65566

RE: Project: NPDES (RIVERMINES)
Pace Project No.: 60204550

Dear Amy Sanders:

Enclosed are the analytical results for sample(s) received by the laboratory on October 08, 2015. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Jamie Church
jamie.church@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

This report shall not be reproduced, except in full,
without the written consent of Pace Analytical Services, Inc..



Pace Analytical Services, Inc.

9608 Loiret Blvd.

Lenexa, KS 66219

(913)599-5665

CERTIFICATIONS

Project: NPDES (RIVERMINES)

Pace Project No.: 60204550

Kansas Certification IDs

9608 Loiret Boulevard, Lenexa, KS 66219

WY STR Certification #: 2456.01

Arkansas Certification #: 15-016-0

Illinois Certification #: 003097

Iowa Certification #: 118

Kansas/NELAP Certification #: E-10116

Louisiana Certification #: 03055

Nevada Certification #: KS000212008A

Oklahoma Certification #: 9205/9935

Texas Certification #: T104704407

Utah Certification #: KS00021

REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.

9608 Loiret Blvd.

Lenexa, KS 66219

(913)599-5665

SAMPLE SUMMARY

Project: NPDES (RIVERMINES)

Pace Project No.: 60204550

Lab ID	Sample ID	Matrix	Date Collected	Date Received
60204550001	38091 / RIVERMINES DOWNSTREAM	Water	10/07/15 11:13	10/08/15 08:50
60204550002	38092 / RIVERMINES UPSTREAM	Water	10/07/15 11:37	10/08/15 08:50
60204550003	38093 / RIVERMINES 001	Water	10/07/15 11:28	10/08/15 08:50

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Lenexa, KS 66219
(913)599-5665

SAMPLE ANALYTE COUNT

Project: NPDES (RIVERMINES)
Pace Project No.: 60204550

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
60204550001	38091 / RIVERMINES DOWNSTREAM	EPA 200.7	TDS	6	PASI-K
		EPA 200.7	JGP	3	PASI-K
		SM 2540D	CRS	1	PASI-K
		EPA 300.0	AJM	1	PASI-K
60204550002	38092 / RIVERMINES UPSTREAM	EPA 200.7	TDS	6	PASI-K
		EPA 200.7	JGP	3	PASI-K
		SM 2540D	CRS	1	PASI-K
		EPA 300.0	AJM	1	PASI-K
60204550003	38093 / RIVERMINES 001	EPA 200.7	TDS	3	PASI-K
		SM 2540D	CRS	1	PASI-K
		SM 2540F	CRS	1	PASI-K
		EPA 300.0	AJM	1	PASI-K

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**ANALYTICAL RESULTS**

Project: NPDES (RIVERMINES)

Pace Project No.: 60204550

Sample: 38091 / RIVERMINES
DOWNSTREAM **Lab ID:** 60204550001 **Collected:** 10/07/15 11:13 **Received:** 10/08/15 08:50 **Matrix:** Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Cadmium	8.4	ug/L	5.0	0.56	1	10/09/15 10:00	10/12/15 15:51	7440-43-9	
Calcium	166000	ug/L	100	5.2	1	10/09/15 10:00	10/12/15 15:51	7440-70-2	
Lead	10.1	ug/L	5.0	1.9	1	10/09/15 10:00	10/12/15 15:51	7439-92-1	
Magnesium	47200	ug/L	50.0	13.3	1	10/09/15 10:00	10/12/15 15:51	7439-95-4	
Total Hardness by 2340B	608000	ug/L	500		1	10/09/15 10:00	10/12/15 15:51		
Zinc	6290	ug/L	50.0	2.6	1	10/09/15 10:00	10/12/15 15:51	7440-66-6	
200.7 Metals, Dissolved (LF) Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Cadmium, Dissolved	8.8	ug/L	5.0	0.56	1	10/13/15 14:40	10/14/15 15:40	7440-43-9	D9
Lead, Dissolved	10.8	ug/L	5.0	1.9	1	10/13/15 14:40	10/14/15 15:40	7439-92-1	D9
Zinc, Dissolved	6740	ug/L	50.0	2.6	1	10/13/15 14:40	10/14/15 15:40	7440-66-6	
2540D Total Suspended Solids Analytical Method: SM 2540D									
Total Suspended Solids	6.0	mg/L	5.0	5.0	1		10/09/15 08:34		
300.0 IC Anions 28 Days Analytical Method: EPA 300.0									
Sulfate	402	mg/L	50.0	11.8	50		10/10/15 19:09	14808-79-8	

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ANALYTICAL RESULTS

Project: NPDES (RIVERMINES)

Pace Project No.: 60204550

Sample: 38092 / RIVERMINES
UPSTREAM **Lab ID:** 60204550002 **Collected:** 10/07/15 11:37 **Received:** 10/08/15 08:50 **Matrix:** Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Cadmium	<0.56	ug/L	5.0	0.56	1	10/09/15 10:00	10/12/15 15:53	7440-43-9	
Calcium	47000	ug/L	100	5.2	1	10/09/15 10:00	10/12/15 15:53	7440-70-2	
Lead	<1.9	ug/L	5.0	1.9	1	10/09/15 10:00	10/12/15 15:53	7439-92-1	
Magnesium	28600	ug/L	50.0	13.3	1	10/09/15 10:00	10/12/15 15:53	7439-95-4	
Total Hardness by 2340B	235000	ug/L	500		1	10/09/15 10:00	10/12/15 15:53		
Zinc	5.8J	ug/L	50.0	2.6	1	10/09/15 10:00	10/12/15 15:53	7440-66-6	B
200.7 Metals, Dissolved (LF) Analytical Method: EPA 200.7 Preparation Method: EPA 200.7									
Cadmium, Dissolved	<0.56	ug/L	5.0	0.56	1	10/13/15 14:40	10/14/15 15:43	7440-43-9	
Lead, Dissolved	2.9J	ug/L	5.0	1.9	1	10/13/15 14:40	10/14/15 15:43	7439-92-1	
Zinc, Dissolved	5.8J	ug/L	50.0	2.6	1	10/13/15 14:40	10/14/15 15:43	7440-66-6	
2540D Total Suspended Solids Analytical Method: SM 2540D									
Total Suspended Solids	<5.0	mg/L	5.0	5.0	1		10/09/15 08:35		
300.0 IC Anions 28 Days Analytical Method: EPA 300.0									
Sulfate	34.7	mg/L	2.0	0.47	2		10/09/15 18:39	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: NPDES (RIVERMINES)

Pace Project No.: 60204550

Sample: 38093 / RIVERMINES 001 Lab ID: 60204550003 Collected: 10/07/15 11:28 Received: 10/08/15 08:50 Matrix: Water

Parameters	Results	Units	PQL	MDL	DF	Prepared	Analyzed	CAS No.	Qual
200.7 Metals, Total		Analytical Method: EPA 200.7 Preparation Method: EPA 200.7							
Cadmium	29.4	ug/L	5.0	0.56	1	10/09/15 10:00	10/12/15 16:00	7440-43-9	
Lead	63.9	ug/L	5.0	1.9	1	10/09/15 10:00	10/12/15 16:00	7439-92-1	
Zinc	21300	ug/L	50.0	2.6	1	10/09/15 10:00	10/12/15 16:00	7440-66-6	
2540D Total Suspended Solids		Analytical Method: SM 2540D							
Total Suspended Solids	<5.0	mg/L	5.0	5.0	1		10/09/15 08:35		
2540F Total Settleable Solids		Analytical Method: SM 2540F							
Total Settleable Solids	<0.20	mL/L/hr	0.20	0.20	1		10/09/15 08:05		
300.0 IC Anions 28 Days		Analytical Method: EPA 300.0							
Sulfate	759	mg/L	50.0	11.8	50		10/09/15 18:55	14808-79-8	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: NPDES (RIVERMINES)

Pace Project No.: 60204550

QC Batch: MPRP/33463

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Total

Associated Lab Samples: 60204550001, 60204550002, 60204550003

METHOD BLANK: 1647358

Matrix: Water

Associated Lab Samples: 60204550001, 60204550002, 60204550003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cadmium	ug/L	<0.56	5.0	10/12/15 15:33	
Calcium	ug/L	9.5J	100	10/12/15 15:33	
Lead	ug/L	<1.9	5.0	10/12/15 15:33	
Magnesium	ug/L	<13.3	50.0	10/12/15 15:33	
Total Hardness by 2340B	ug/L	23.7J	500	10/12/15 15:33	
Zinc	ug/L	5.0J	50.0	10/12/15 15:33	

LABORATORY CONTROL SAMPLE: 1647360

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cadmium	ug/L	1000	968	97	85-115	
Calcium	ug/L	10000	9900	99	85-115	
Lead	ug/L	1000	990	99	85-115	
Magnesium	ug/L	10000	9500	95	85-115	
Total Hardness by 2340B	ug/L		63800			
Zinc	ug/L	1000	961	96	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1647361 1647363

Parameter	Units	60204549001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	Max RPD	Qual
Cadmium	ug/L	<0.56	1000	1000	988	1000	99	100	70-130	1	20
Calcium	ug/L	98000	10000	10000	109000	108000	112	97	70-130	1	20
Lead	ug/L	3.0J	1000	1000	984	1000	98	100	70-130	2	20
Magnesium	ug/L	51700	10000	10000	62300	61600	107	100	70-130	1	20
Total Hardness by 2340B	ug/L	457000			529000	523000				1	
Zinc	ug/L	121	1000	1000	1060	1080	94	96	70-130	2	20

MATRIX SPIKE SAMPLE: 1647364

Parameter	Units	60204551002 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Cadmium	ug/L	<0.56	1000	1000	100	70-130	
Calcium	ug/L	51800	10000	61800	101	70-130	
Lead	ug/L	<1.9	1000	1010	101	70-130	
Magnesium	ug/L	31700	10000	41800	101	70-130	
Total Hardness by 2340B	ug/L	260000		326000			
Zinc	ug/L	7.0J	1000	972	96	70-130	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: NPDES (RIVERMINES)

Pace Project No.: 60204550

QC Batch: MPRP/33508

Analysis Method: EPA 200.7

QC Batch Method: EPA 200.7

Analysis Description: 200.7 Metals, Dissolved

Associated Lab Samples: 60204550001, 60204550002

METHOD BLANK: 1649804

Matrix: Water

Associated Lab Samples: 60204550001, 60204550002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Cadmium, Dissolved	ug/L	<0.56	5.0	10/14/15 15:19	
Lead, Dissolved	ug/L	<1.9	5.0	10/14/15 15:19	
Zinc, Dissolved	ug/L	<2.6	50.0	10/14/15 15:19	

LABORATORY CONTROL SAMPLE: 1649805

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cadmium, Dissolved	ug/L	1000	982	98	85-115	
Lead, Dissolved	ug/L	1000	1030	103	85-115	
Zinc, Dissolved	ug/L	1000	996	100	85-115	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1649806 1649807

Parameter	Units	60204550001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Cadmium, Dissolved	ug/L	8.8	1000	1000	1030	1030	102	102	70-130	0	20	
Lead, Dissolved	ug/L	10.8	1000	1000	1030	1030	102	102	70-130	0	20	
Zinc, Dissolved	ug/L	6740	1000	1000	7690	7560	95	82	70-130	2	20	

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QUALITY CONTROL DATA

Project: NPDES (RIVERMINES)

Pace Project No.: 60204550

QC Batch: WET/57679

Analysis Method: SM 2540D

QC Batch Method: SM 2540D

Analysis Description: 2540D Total Suspended Solids

Associated Lab Samples: 60204550001, 60204550002, 60204550003

METHOD BLANK: 1647151

Matrix: Water

Associated Lab Samples: 60204550001, 60204550002, 60204550003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Total Suspended Solids	mg/L	<5.0	5.0	10/09/15 08:27	

SAMPLE DUPLICATE: 1647152

Parameter	Units	60204581001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	25.0	26.0	4	10	

SAMPLE DUPLICATE: 1647153

Parameter	Units	60204518001 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Suspended Solids	mg/L	<5.0	<5.0		10	

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QUALITY CONTROL DATA

Project: NPDES (RIVERMINES)
Pace Project No.: 60204550

QC Batch: WETA/36282 Analysis Method: EPA 300.0
QC Batch Method: EPA 300.0 Analysis Description: 300.0 IC Anions
Associated Lab Samples: 60204550001, 60204550002, 60204550003

METHOD BLANK: 1647186 Matrix: Water
Associated Lab Samples: 60204550001, 60204550002, 60204550003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<0.24	1.0	10/09/15 09:55	

METHOD BLANK: 1648043 Matrix: Water
Associated Lab Samples: 60204550001, 60204550002, 60204550003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
Sulfate	mg/L	<0.24	1.0	10/10/15 15:33	

LABORATORY CONTROL SAMPLE: 1647187

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.8	95	90-110	

LABORATORY CONTROL SAMPLE: 1648044

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	5	4.8	95	90-110	

MATRIX SPIKE SAMPLE: 1647188

Parameter	Units	60204521001 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	ND	500	525	92	80-120	

MATRIX SPIKE SAMPLE: 1647189

Parameter	Units	60204550003 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Sulfate	mg/L	759	250	970	84	80-120	

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QUALIFIERS

Project: NPDES (RIVERMINES)
Pace Project No.: 60204550

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.
ND - Not Detected at or above adjusted reporting limit.
J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.
MDL - Adjusted Method Detection Limit.
PQL - Practical Quantitation Limit.
RL - Reporting Limit.
S - Surrogate
1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.
Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.
LCS(D) - Laboratory Control Sample (Duplicate)
MS(D) - Matrix Spike (Duplicate)
DUP - Sample Duplicate
RPD - Relative Percent Difference
NC - Not Calculable.
SG - Silica Gel - Clean-Up
U - Indicates the compound was analyzed for, but not detected.
N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.
Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.
TNI - The NELAC Institute.

LABORATORIES

PASI-K Pace Analytical Services - Kansas City

ANALYTE QUALIFIERS

B Analyte was detected in the associated method blank.
D9 Dissolved result is greater than the total. Data is within laboratory control limits.

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: NPDES (RIVERMINES)

Pace Project No.: 60204550

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
60204550001	38091 / RIVERMINES DOWNSTREAM	EPA 200.7	MPRP/33463	EPA 200.7	ICP/24658
60204550002	38092 / RIVERMINES UPSTREAM	EPA 200.7	MPRP/33463	EPA 200.7	ICP/24658
60204550003	38093 / RIVERMINES 001	EPA 200.7	MPRP/33463	EPA 200.7	ICP/24658
60204550001	38091 / RIVERMINES DOWNSTREAM	EPA 200.7	MPRP/33508	EPA 200.7	ICP/24685
60204550002	38092 / RIVERMINES UPSTREAM	EPA 200.7	MPRP/33508	EPA 200.7	ICP/24685
60204550001	38091 / RIVERMINES DOWNSTREAM	SM 2540D	WET/57679		
60204550002	38092 / RIVERMINES UPSTREAM	SM 2540D	WET/57679		
60204550003	38093 / RIVERMINES 001	SM 2540D	WET/57679		
60204550003	38093 / RIVERMINES 001	SM 2540F	WET/57678		
60204550001	38091 / RIVERMINES DOWNSTREAM	EPA 300.0	WETA/36282		
60204550002	38092 / RIVERMINES UPSTREAM	EPA 300.0	WETA/36282		
60204550003	38093 / RIVERMINES 001	EPA 300.0	WETA/36282		

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Sample Condition Upon Receipt

WO# : 60204550



60204550

Client Name: Doel Run

Courier: FedEx ☒ UPS ☐ VIA ☐ Clay ☐ PEX ☐ ECI ☐ Pace ☐ Other ☐ Client ☐

Tracking #: 7746 8134 8400

Pace Shipping Label Used? Yes ☐ No ☒

Custody Seal on Cooler/Box Present: Yes ☒ No ☐ Seals intact: Yes ☒ No ☐

Packing Material: Bubble Wrap ☒ Bubble Bags ☐ Foam ☐ None ☐ Other ☐

Thermometer Used: CF +0.6 T-239 / CF +0.6 T-262

Type of Ice: wet Blue ☐ None ☐ Samples received on ice, cooling process has begun.
(circle one)

Cooler Temperature: 1.3

Date and initials of person examining contents: dw 10/8/15 jof

Temperature should be above freezing to 6°C

Chain of Custody present:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody filled out:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody relinquished:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler name & signature on COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples arrived within holding time:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time analyses (<72hr):	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	6. <u>Soil-Sol.</u>
Rush Turn Around Time requested:	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient volume:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Pace containers used:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
Containers intact:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Unpreserved 5035A soils frozen w/in 48hrs?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	11.
Filtered volume received for dissolved tests?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input checked="" type="checkbox"/> N/A	12.
Sample labels match COC:	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Includes date/time/ID/analyses	Matrix: <u>water</u>	13.
All containers needing preservation have been checked.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
All containers needing preservation are found to be in compliance with EPA recommendation.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	14.
Exceptions: VOA, Coliform, O&G, WI-DRO (water)	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Initial when completed <u>dw</u> Lot # of added preservative
Trip Blank present:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	
Pace Trip Blank lot # (if purchased):	<u>inf</u>	15.
Headspace in VOA vials (>6mm):	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	16.
Project sampled in USDA Regulated Area:	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	17. List State:
Additional labels attached to 5035A vials in the field?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	18.

Client Notification/ Resolution:

Copy COC to Client? Y / N

Field Data Required? Y / N

Person Contacted: _____ Date/Time: _____

Comments/ Resolution: _____

_____ 10/8/15 _____

Project Manager Review: _____ Date: _____

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately

Section A

Required Client Information:

Company: The Doe Run Company

Address: PO Box 500

Email To: asanders@doerun.com

Phone: (573) 689-4535

Fax: (573) 244-8179

Requested Due Date/TAT: 5 To 7 Days

Section B

Required Project Information:

Report To: Amy Sanders

Copy To:

Purchase Order No.:

Project Name: NPDES (Rivermines)

Project Number:

Section C

Invoice Information:

Attention: Amy Sanders

Company Name: The Doe Run Company

Address: PO Box 500, Viburnum, MO 65568

Quote Reference:

Project Manager:

Face Profile #:

REGULATORY AGENCY

☐ NPDES ☐ GROUND WATER

☐ UST ☐ RCRA

Site Location

MO

STATE:

Page: 1 of 1

COC#: 2764

60204550

Section C Required Sample Information		Valid Matrix Codes		COLLECTED DATE/TIME				Bottles / Preservatives		Requested Analysis Filtered (Y/N)																SEMO Lab Project No./ Lab I.D.										
ITEM #	SAMPLE ID (A-Z, 0-9 / -) Sample IDs MUST BE UNIQUE	MATRIX WATER WASTE WATER SOIL/SOLID	CODE WT WW SL	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COMPOSITE START		COMPOSITE END / GRAB		Total # OF CONTAINERS	250 mL Unpreserved	500 mL Unpreserved	1 L Unpreserved	250 mL Nitric	250 mL Amber Glass H ₂ SO ₄	250 mL Plastic H ₂ SO ₄	1000 mL Amber HCL	250 mL ZnAc/NaOH	500 mL Amber Glass H ₂ SO ₄	*See Additional Comments Below																
						DATE (mm/dd/yy)	TIME (Military)	DATE (mm/dd/yy)	TIME (Military)											Analysis Test ↓																
1	38091	(B2W) (B3W)		WT	G			10/07/15	1113	2	1	1									CD-D, PB-D, ZN-D, HARD, SO4, CD-T, PB-T, TSS-T, ZN-T	vermines Downstr														
2																																				
3	38092			WT	G			10/07/15	1137	2	1	1									CD-D, PB-D, ZN-D, HARD, SO4, CD-T, PB-T, TSS-T, ZN-T	vermines Upstream														
4																																				
5	38093	(B1W) (B2W) (B3W)		WW	G			10/07/15	1128	3	1	1	1								SO4, SS, TSS, CD-T, PB-T, ZN-T	Rivermines 001														
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ADDITIONAL COMMENTS

*200.7 Total Recoverable and Dissolved Metals

RELINQUISHED BY / AFFILIATION

L Hopkins DRC

DATE

10/7/15

ACCEPTED BY / AFFILIATION

[Signature] 10/7/15

DATE

10/7/15

TIME

1330

SAMPLE CONDITIONS

1.3 Y Y Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER:

Larry Hopkins

SIGNATURE of SAMPLER:

[Signature]

DATE Signed

(MM/DD/YY):

10/7/15

Temp in °C

pH in SU

Received on

ice (Y/N)

Custody

Sealed Cooler

(Y/N)